DOCUMENT RESUME

ED 480 234 SP 041 766

AUTHOR	Fluellen, Jerry E., Jr.
TITLE	Teaching for Understanding: Harvard Comes to Pennell Elementary. A Teacher Research Report.
PUB DATE	2003-07-00
NOTE	25p.
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	EDRS Price MF01/PC02 Plus Postage.
DESCRIPTORS	Black Students; Character Education; Core Curriculum; Culturally Relevant Education; *Curriculum Development; Drama; Elementary Education; Grade 5; History Instruction; *Interdisciplinary Approach; Literacy Education; Mathematics Education; *Multiple Intelligences; Physical Fitness; Reading Skills; Science Education; Technology Education; Thinking Skills
IDENTIFIERS	Piaget (Jean)

ABSTRACT

During the 2002-03 school year, one Philadelphia fifth grade class developed a core curriculum designed to teach every child the 21st century basic skills: the ability to think, learn, and create. This effort was a pilot for a rigorous Harvard University based program to develop proficiency for each child in a mixed ability classroom of 29 African-American students, three of whom were defined as gifted and one of whom was identified as special needs. Each of the students had many gifts across a spectrum of nine intelligences. The facilitator blended a teaching for understanding approach, the multiple intelligences approach, Piaget's reflecting abstraction process, and a set of five life values to give children a deeper understanding of mathematics, literacy, science, and history. Students participated in character education, technology classes, a theater class, a books challenge class, a physical fitness class, and daily practice of meditation and Tai Chi, all woven into the core curriculum. Ongoing assessments evaluated the experience. Overall, children practiced mindful learning in math, literacy, science, and history. Children created works, including electronic portfolios, to demonstrate understanding and build new understanding. Children developed all their multiple intelligences with an emphasis on higher order, logical mathematical, and verbal linguistic intelligences. (Contains 16 references.) (SM)

Reproductions supplied by EDRS are the best that can be made
from the original document.

SP SPTR 0294

"A French cultural psychologist, Ignace Meyerson, first enunciated an idea that today, a quarter-century after his death, now seems both obvious and brimming with educational implications. Briefly, his view was that the main function of all collective cultural activity is to produce 'works'—oeuvres, as he called them, works that, as it were, achieve an existence of their own."

Jerome Bruner
The Culture of Education

ED 480 234

Teaching for Understanding

Harvard Comes to Pennell Elementary

A teacher research report

July 2003

By Jerry E. Fluellen, Jr.
Philadelphia Writing Project
University of Pennsylvania

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Jerry E. Fluellen Jr.

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

SP 041746

BEST COPY AVAILABLE

"Something wonderful is about to happen."

That line from David Bowman, an Arthur Clarke character in his science fiction novel *2061*, speaks of Jupiter's change to a second sun for our Solar System. This sun extended the growing seasons on Earth and put an end to the nuclear confrontation about to occur between the superpowers. At the same time, it reminded Earth beings of a power greater than self.

In Philadelphia, Paul Vallas' administration, too, is creating a second sun, one aimed at extending the intellectual growing seasons in our schools and putting an end to the waste of intellectual talent in schools formerly marked as wastelands. Thanks to the vision of Chief Executive Officer (CEO) Vallas, the "leave no child behind act" has been living large in the School District of Philadelphia and serves as a power greater than individual schools.

During the 2002-2003 school year, a fifth grade class at Joseph Pennell Elementary School anticipated this rising second sun in the form of a core curriculum that seeks to teach each child the 21st century basic skills—the abilities of thinking, learning, and creating. It was a pilot for a rigorous, Harvard University based program to develop proficiency for each child in a mixed ability classroom.

29 African American children made up this pilot class. Three of them were defined as mentally gifted by traditional intelligence testing. One was a special needs child mainstreamed. Each child had many gifts across a spectrum of nine intelligences when seen with the lenses of Howard Gardner's multiple intelligences theory.

The facilitator blended Harvard University Project Zero Research Center's "teaching for understanding framework," Howard Gardner's "MI approach," Piaget's reflecting abstraction process, and a set of five life values to give children a deeper understanding of mathematics, literacy, science, and history.

That meant two new paradigm instructional design theories aimed at deep disciplinary understanding, one exemplary, 50 year research program and character education organized a year long set of projects as follows:

- math (statistics, number theory, algebra, and fractals for children as enrichment math)
- literacy (fiction reading and writing, nonfiction reading and writing, poetry reading and writing, and a special Shakespeare for Children project as enrichment reading)
- Multidisciplinary projects to highlight science or history (Malcolm X, Dolphins in Danger, Starbase Earth, Challenger: Dead or Alive, Gulf War 2, and Alex Haley's *Roots)*
- A discipline plan based on **RAPPP** agreements or values (**R**evere life. **A**lways do your best. **P**ractice following directions. **P**ractice being impeccable with your word. **P**ractice thinking, learning, and creating–the 21st century base skills.)

In addition, twice weekly technology classes, a weekly theater class, a weekly 100 books challenge class, a weekly physical fitness class, and daily practice of Tai Chi and meditation--all punctuated the core program. Thus, this total instructional program sought to develop the multiple intelligences profile of each whole child. That meant no matter how high or low a given intelligence had been when the child became a member of the class, the program sought to help him or her to become more word smart, number smart, music smart, sports smart, art smart, people smart, self smart, nature smart, and God smart. Translated, these are Howard Gardner's multiple intelligences. He says most human beings have had these as a basic endowment.

Specifically these nine intelligences are capable of growing with the help of parents, teachers, coaches, and other caring adults as well as a supportive environment:

1. **verbal linguistic intelligence**
2. **logical mathematical intelligence**
3. **musical intelligence**
4. **bodily kinesthetic intelligence**
5. **visual spatial intelligence**
6. **interpersonal intelligence**
7. **intrapersonal intelligence**
8. **naturalistic intelligence**
9. **existential intelligence**

In the fall of 2003, though the core curriculum will not say so explicitly, schools across the district of Philadelphia will embark on a journey to develop each child's full intelligence profile, beginning with a core curriculum in mathematics and literacy.

This core curriculum, for example, will provide focused experiences in logical mathematical intelligence (the capacity to solve problems or fashion intellectual products in mathematics or science) and verbal linguistic intelligence (the capacity to solve problems or fashion intellectual products in language). At that time the Terra Nova standard achievement tests of reading, language, mathematics, and science along with regular benchmark tests will become the primary assessment tools to describe success in developing these intelligences. It will compare scores to national norms as well.

Likewise the PSSA measures achievement in mathematics and reading.

In the language of everyday teachers, the core curriculum offers a sequential instructional program in mathematics and literacy. Both content areas are organized in six, six week blocks set to pacing schedules so that each child gets the same basic instruction around the district. The sixth week of the block gives time for reflection, review, enrichment, and formal assessments.

The mathematics program in 5^{th} grade, for example, makes full use of the National Council for Mathematics model for teaching and *Everyday Math* as its basic set of texts and materials. Each daily 90 minute lesson targets a specific standard and reaches for proficiency in that standard over time. During the sixth week of each block, a benchmark assessment speaks to the degree of understanding each child has gained and allows the teacher to diagnose individual needs.

Likewise the literacy program in 5th grade connects reasoning, reading, writing, speaking, and listening into a working whole with six themes, one for each of the six, six-week blocks, punctuated with a week of reflection, review, enrichment and formal assessment. *Trophies*, a thematically organized reading program by Harcourt Brace, in addition, provides a deep level, multicultural base to the reading experiences in its themes. Multiple intelligence theory provides a framework for all of the suggested before, during, and after (BDA) activities.

Indeed both *Everyday Math* and *Trophies* suggest activities that cross Howard Gardner's MI theory. These activities provide multiple representations aimed at understanding the content.

The 2002-2003, pilot 5th grade class at Joseph Pennell anticipated this thrust and brought Harvard University to the classroom.

Teacher Inquiry

This teacher research report, then, explores the following inquiry: what happens in a class that fosters Harvard University approaches to teaching for understanding?

To explore this teacher research question, the facilitator's instructional program for the pilot class featured a 90 minute block for math, a 120 minute block for literacy, and a series of multidisciplinary projects to connect science and literacy or history and literacy with technology.

That meant math offered intensive work in statistics, number theory, and algebra with an emphasis on higher order ends of logical mathematical intelligence (problem solving, linking operations to solve problems, metacognition, deductive reasoning, and inductive reasoning). As an enrichment math project during the final days of the school year, the children engaged fractal geometry to explore self similar shapes in math, nature, music and art as well.

That meant literacy offered an in depth study of suspense stories; science based, narrative non fiction and writing informational papers; realistic fiction reading and writing; connecting poetry, art, and songs; and, finally, Shakespeare's Romeo and Juliet (in story form) as an end of the year, enrichment reading project. Here the emphasis had been on the higher order ends of verbal linguistic intelligence (expressive writing, narrative writing, poetry, oral discourse or debate, and metalinguistics--thinking about language).

The facilitator offered a series of multidisciplinary projects to highlight deeper understanding of history and science. The projects were as follows:

- Malcolm X (History/the 1960s)
- Gulf War 2 (History/current events)
- Alex Haley's *Roots* (History/slavery to reconstruction)
- Dolphins in Danger (Earth Science)
- Starbase Earth (Space Science)
- Challenger Dead or Alive (Space Science/current events)

In the case of each multidisciplinary project, the facilitator used Harvard University Project Zero's teaching for understanding framework as the planning model. That meant each project began with a **generative topic**—one appealing to both the children and the facilitator. A generative topic also stated the content area in brief. For example, "Alex Haley's *Roots*" held appeal and stated its history/literacy connection in just three words.

Each project had a **throughline**–some important idea that learners would refer to over and over. The stated throughline for all projects was this: think, learn, and create. These can be thought of as 21st century basic skills across the nation regardless of the particulars of a given set of standards or curricula. The silent throughline was be a mindful learner, Ellen Langer's powerful theory in brief.

Each project had a set of **understanding goals** that told what key understanding the learners would seek. For example, in the Haley project children sought to understand how to create a Claris Works slide show for knowledge as design questions that compared the novel *Roots* to the film.

Each project had **understanding performances**–works the learners would create. In the case of the Haley project, children produced daily works of the reasoning, writing, reading, speaking, listening, and viewing kind for the purpose of effective learning. In addition, they produced graded works (formal assessments) to show what they understood and to create new understanding. For example, in the Haley project, the children wrote journal responses to dramatic readings of selected chapters from the novel, image maps of the film, retellings of the film, and a knowledge as design analysis in preparation for the Claris Works slide show. These represented non graded performances such as the journal responses and graded responses such as the retellings. As a bonus, four children delivered oral reports from their knowledge as design questions and answers placed on 5x8 note cards.

Armeesha used the image maps to write an original play. She organized several children in the class as actors and directed them in a performance.

Ongoing assessments included daily recitations and reflections as well as works assessed with a rubric such as the PSSA rubric for writing or the class created rubric for understanding.

Harvard Project Zero researchers said four assessment types could guide finding out what children understood about a subject. All four types found their way into the ongoing assessments of works in the Haley project:

1. **observations**
2. **documents**
3. **performances**
4. **portfolios**

In the instance of the Haley project, the facilitator observed each child's understanding by walking around to small groups and individuals, reading responses, listening to responses, and recording responses on chart paper. In addition, the children made frequent use of a "parking lot" (questions written on 3x5 post-its and pasted to chart paper hanging in a central location in the room).

The facilitator graded selected documents such as the retellings, knowledge as design analyses, and Claris Works slide shows.

While performances such as Armeesha's play and creative dramatics exercises in which children acted out images from the film were non graded assessments of understanding, the portfolio entries were graded. Specifically, as a final assessment of understanding, the Claris Work slide show offered each child a chance to show his or her understanding as well as build new understanding from one on one conferences with the facilitator.

More generally, all multidisciplinary projects in the pilot class led to electronic portfolios of best works in the computer lab. All projects made use of David Perkins' knowledge as design (KAD) method of critical and creative thinking. KAD, in fact, had served as the bread and butter method for creating works. Children used the method to create "oeuvres" that showed what they understood and built new understandings.

Finally, the facilitator used the five features of Harvard's teaching for understanding framework (generative topic, throughline, understanding goals, understanding performances, and ongoing assessments) to plan each project. Harvard had come to Pennell Elementary.

"Alex Haley's *Roots*"—teaching kids to think like historians

For the sake of economy, this report highlights "Alex Haley's *Roots*" as an exemplary history centered project informed by the facilitator's work as an American History Fellow for the School District of Philadelphia in 2002-2003.

Alex Haley's *Roots*, as a six week, multidisciplinary project, focused on one goal: understand how to create a knowledge as design, Claris Works slide show. To see how this worked, examine the actual final performance assessment of understanding for the project. Then see what the children did to get ready for such a work. Finally, see how the same knowledge as design method of critical thinking that children used to reflect on the Haley project became the facilitator's way to reflect on the whole year. In both cases, knowledge as design helped to guide mindful learning in the Ellen Langer sense.

Alex Haley's *Roots*:

Final performance assessment for a multidisciplinary project

By Jerry E. Fluellen, Jr.
American History Fellow
Joseph Pennell Elementary School

June 2003

Directions

After you complete a critical viewing of the film and read the book Roots by Alex Haley, answer the knowledge as design questions below. These questions help you to think critically and creatively about these two landmark media events in our nation. They help you to analyze *Roots*.

When you have finished reading the book and viewing the film, answer the questions below. Then, use your answers to create Claris Works slide shows in the computer lab. Some of you may also wish to make oral presentations to the class or do a creative project such as write an original play or story.

1. Why did we explore Alex Haley's *Roots*, novel and film? (Purpose)
2. What images stand out in both the novel and film? (Structure)
3. Who are the main characters, and how do they connect? (Structure)
4. How is Alex Haley's family similar to your own family? How is his family different from your own family? (Model Case)
5. To what degree is "Roots" a metaphor for the African American family? (Argument level one, explanatory)
6. What is missing from Alex Haley's story of his family? (Argument level two, evaluative)
7. How do race, class, and gender shed light on both the novel and film? (Argument level three, deep explanatory)
8. What new questions emerge from the novel and film? (Wild card: invent your own design)
9. What new creative projects will emerge from this report? (Wild card: invent your own design; for examples, create family tree or biographical sketch of a family member; write an original play, story, poem, or informational paper; etc.)

But the Haley project did not begin with knowledge as design questions. Children completed a KWLS on "Eyewitness to the Underground Railroad," an article from the February issue of *National Geographic Explorer*, as a **point of entry** into the Haley project. This gave them insights into oral history and an appreciation of how William Still used this historian's tool to capture the stories of slaves who had escaped to Philadelphia. Next, they completed a knowledge as design analysis of Maya Angelou's "on the pulse of morning." This poem served as a **powerful metaphor** for the roots of the human family.

Finally, the children turned their full attention to "Alex Haley's *Roots*." These activities were the **multiple representations** across several intelligences. These aimed at deep disciplinary understanding. In sum, the entire project had used Howard Gardner's MI approach (a new paradigm instructional design theory) to organize both the project and day to day lesson into point of entry, powerful metaphor, and multiple representations with different activities across one or more of the nine intelligences.

Of course, Howard Gardner is a Harvard Project Zero Senior Researcher and author of the landmark multiple intelligences theory. The MI approach is the practical application of his theory.

Thus, children in the pilot class engaged a rigorous; Harvard University based method for understanding subjects more deeply. The MI approach also organized the day to day lessons; it was the main method for teaching and learning in the math and literacy core subjects as well as the series of multidisciplinary projects.

In the case of Alex Haley's *Roots*, the MI approach translated into works. Most of the children bought the novel and dug into the 120 chapter experience. Sean and Armeesha, two of the mentally gifted children in the class, read the whole book. Marlo, Shanika, and Jonta joined them. 20 other children read at least five chapters, leaving only four children who did not read. All 29 children heard the facilitator read, dramatically, selected chapters; all saw the six episode film.

For each viewing of the film, the children made image maps to retell the episode. By the end of the six episode film, the facilitator had collected 20 images on chart papers hung around the room. These retold the whole film. Then each child wrote hard copy drafts of his or her own retelling. This "oeuvre" prepared them for critical thinking with knowledge as design. It gave them a baseline understanding for the more challenging task ahead.

After children drafted responses to the knowledge as design questions, they created Claris Works slide shows in Dorothy Craig's twice per week computer lab. Ms. Craig, an exemplary technology teacher, gave them instructions in creating the slide show while the facilitator gave up the last 20 minutes of each prep period for personalized conferences and assessments of understanding.

29 of the 29 children created Claris Works slide shows. When assessed with the PSSA Rubric for good writing, the slide show quality ranged from 4 rating to a 2, or advanced to basic. No slide show rated below basic, but over a half dozen scored the top rating on the PSSA rubric for good writing. Most of the slide shows scored at the 3 and 4 levels of the 4 point rubric. In brief, a lot of slide shows demonstrated understanding of these difficult questions.

Texts for two slide shows, delivered as oral presentations by two of pairs of students, became entries in *Gift Givers*, a literary magazine. This work expanded to include best works from all the 5th grade classes. A representative child presented the magazine to the principal, Ms. Gaddie, at the closing exercise for the class of 2003.

The presentations serve here as illustrations of children's work, Piaget's reflecting abstraction, and Langer's mindful learning.

Excerpt from *Gift Givers* literary magazine

Oral presentations from Alex Haley's Roots (a final multidisciplinary project) by Samantha Pullins, Shanika Steward, Natalie Smith, and Tyrikah Hightower

1. Why did we explore Alex Haley's Roots, novel and film? We explored the novel and film to get a better understanding of families. Also, we wanted to get a deeper understanding of our history as well as the differences between the novel and film.
2. What images stand out in both the novel and film? The images that stand out are how Kunta's family went from generation to generation. In both the novel and film, the overseer beat Kunta almost to death until he said his name was Toby.
3. Who are the main characters and how do they connect? The main characters are Omoro, Benta, Kunta, Bell, and Kizzy. They span the generations to connect the Haley family. Both Omoro and Kunta held their children up to Allah for blessing and naming. Chicken George and Tom led the family to freedom.
4. How is Alex Haley's family similar to your family? How is it different? His family started in Africa. Ours started in the South. We both have family roots. Also, another difference is that my great grand mom came from India.
5. To what degree is Roots a metaphor for the African American family? Roots stands for the generations of a people.
6. What is missing from Alex Haley's family? We do not learn much about who came before Benta and Omoro nor who came after Alex Haley.
7. How do race, class, and gender shed light on both the novel and the film? Race, class, and gender are an important part of any film and novel. In *Roots*, there are black and white people; rich, middle, and poor classes; and men and women.
8. What new questions emerge from the novel and film? Who are Benta's parents? How many children did Alex Haley have?

Piaget's view on what it means to understand

Piaget's last research project in the years before his death says a lot about what it means to understand. His is a theoretical explanation.

The "reflecting abstraction process" had emerged from his 50 years of research into cognitive development and processes. Applied to the illustration of works from children with knowledge as design, it provides a deeper view of understanding.

A tennis ball opens the facilitator's thinking about Piaget's reflecting abstraction process.

Imagine a tennis ball. You are holding it in your hand. You feel its spherical shape. You feel its rubber beneath the cover. You see the yellow color. It is the size of a small orange.

These physical features are facts. They are part of the ball. Most people who hold the same ball would see these features. The features of roundness, rubber, color, and size are empirical. In Piaget's view they require empirical abstraction. You collected the features from actual observations.

For the children in Alex Haley's *Roots* project, the film became a form of empirical abstraction. For each episode, they collected facts as images. For example, "Benta gave birth to Kunta." That is the image in the opening scene. All who see the film could agree on this fact.

For Piaget, empirical abstraction is the first level of understanding. For teachers in the field, this often is what is called "hands on."

The tennis ball illustrates another characteristic of the reflecting abstraction process. Take the ball in your hand and bounce it on the clay court. It hits the clay and rises up in the air. You say the rubber in the ball gives it spring. When the rubber reaches the clay with a certain amount of force, it rises up in the air--it bounces.

Now you have abstracted the quality of bounciness from the ball. That is reflecting abstraction.

In the case of children watching the *Roots* film, they recognized that Benta's giving birth to Kunta started off the chain of generations that led to Alex Haley. They abstracted from the fact of birth that many births over time made generations. For teacher in the field, this would be reflecting on the hands on activity.

Piaget's research did not stop with reflecting abstraction. He noticed that some children think about their thinking. Take the tennis ball. The same quality of bounciness enabled Serena Williams to serve a ball at 110 miles per hours and place it in a relatively small rectangle across the court. You realize that the bounciness of the ball meets with the force of the racket times the coordination of her body to control the trajectory. You have engaged reflected abstraction. You have thought about your thinking.

The children realized that if Alex Haley could trace his family to Benta's birth of Kunta Kinte, then they could trace their families as well. For teachers in the field who dare to have children do more, this is beyond hands on. It gets into the realm of minds on when children think about their thinking.

But Piaget did not stop here either. He realized that some people reflect on their thinking about their thinking. He knew such reflection could be continuous and endless.

You realize that the same bounciness quality enabled Venus to return Serena's serve and place a forehand shot for a winner. You realize that the place of serves and shots times the coordination of the body and the degree of force from swinging the racket times the strategy of varying the force and placements leads to winning the match. You realize that all great tennis games share these features and that tennis itself involves offense and defense. You begin to see analogies between tennis and seemingly different sports such as basketball and football. You see tennis as a metaphor for life with its serves and smashes and winners and losers and good sports. You see both competition and cooperation in the game. You engage metareflection.

Such thinking about your thinking about your thinking could include an analysis of the physics and chemistry involved in a tennis ball or the economics of professional sports. Metareflection is without limits.

Likewise, the girls using knowledge as design engaged metareflection on *Roots*. Take question seven, for example.

"How do race, class, and gender shed light on both the novel and the film? Race, class, and gender are an important part of any film and novel. In *Roots*, there are black and white people; rich, middle, and poor classes; and men and women."

This response goes beyond mere empirical abstraction. They are not just stating facts in the film and novel. It rises above reflecting abstraction and reflected abstraction as well. They are not commenting on facts or thinking about their comments on race, class, and gender. When they say "race, class, and gender are an important part of any film and novel," they are seeing connections across a range of fiction. When they say "there are black and white people; rich, middle, and poor classes; and men and women," they both show an understanding of these difficult concepts and continue thinking about their thinking a step higher.

True they could have given reasons for their argument and examples from the film and novel. True they could have explained race, class, and gender in more detail and shown how they are important in other films and books. In other, words, there is no limit to metareflection.

Teachers in the field might simply call metareflection deep thinking--beyond hands on and minds on.

Langer's view on mindful learning

Tyler Volk, in his book *Metapatterns*, cites Gregory Bateson, a top, 20th century systems thinker. Bateson once said much of science and math involved "double description." If thinkers could see how two different sources gave the same answer then that answer was likely to be true. A 20 percent tip on a 100 dollar restaurant check was 20% of 100 dollars, on the one hand. It was 10% times 2 on the other hand. Either way the tip became 20 dollars.

Ellen Langer's view of mindful learning echoed Piaget's reflecting abstraction process. The children used empirical reflection, reflecting abstraction, reflected abstraction, and metareflection in Alex Haley's Roots. They also practiced mindful learning.

Says Langer, "a mindful approach to any activity has three characteristics: the continuous creation of new categories; openness to new information; and an implicit awareness of more than one perspective. Mindlessness, in contrast, is characterized by an entrapment in old categories; by automatic behavior that preludes attending to new signals; and by action that operates from a single perspective." That is how she compares mindfulness and mindlessness in her book *The power of mindful learning*.

Right from the point of entry, children welcomed new information about oral history, family trees, roots as a metaphor, contrasts between film and novel, and more. They created new categories: from images to knowledge as design questions. Children, in particular, used knowledge as design questions to explore multiple perspectives along the lines of purpose, structure, model case, and argument. In addition, no two individuals or teams working on the knowledge as design questions answered them in the same way. In whole class recitations, children entertained multiple perspectives on *Roots* including contrasts between the film and the book.

Langer might say the children were mindful learners. Teachers in the field might say the children were deep thinkers. The facilitator might say Piaget's reflecting abstraction process and Langer's mindful learning give a double description on teaching for understanding.

Final Thought

"Education is no substitute for intelligence. That elusive quality is defined only in part by puzzle-solving ability. It is in the creation of new puzzles reflecting what your senses report that you round out the definition."

Frank Herbert
Chapterhouse Dune

To think about the levels of thinking in this teacher research project, the facilitator, like the children, could use David Perkins' knowledge as design method. A Harvard University based researcher, David Perkins says any object or idea is a design structured for some purpose. That means it has a purpose, structure, model case and argument.

Take an ordinary object such as a pencil. When children describe the purpose of pencil one of their responses is the pencil is used for writing. Given this purpose, they say the pencil is made of wood, lead, metal, and rubber. That is its structure. For model cases, they cite other things that write including markers, pens, crayons, chalk. One child (thinking analogically) adds that a computer is a model case as well. Lastly, another child once said that the brain sent a message to the hand which gripped the pencil and held the point to paper. He gave an explanatory argument for how the pencil worked. Children could also evaluate how well the pencil worked as an evaluative argument. They could ask what was missing and what new questions emerged to take advantage of questions often asked in chaos theory.

Perkins' method, in summary, allows thinkers to explore an idea from at least four points of view: purpose, structure, model case, and argument. Any one of these features might have more than one possibility. For example, argument has at least three levels in Perkins' mind. Thus, in the facilitator's reflection on the whole pilot project, there are six points of view: a purpose, structure, and model case plus three levels of arguments, namely, explanatory, evaluative, and deep explanatory.

In the sense of Piaget's reflecting abstraction process the facilitator engaged metareflection or thinking about his levels of thinking. In the sense of Langer's mindfulness theory, the facilitator is practicing mindful learning, in particular holding more than one perspective with each of the features of knowledge as design.

Also, that, in a nutshell, is what happened in the 5th grade, pilot class: both the facilitator and the children engaged the reflecting abstraction process and practiced mindful learning.

What was the purpose of the pilot project? (purpose)

This pilot class sought to work out a model that anticipated the coming core curriculum. The idea had been to teach to proficiency in a group of mixed ability children.

Along the way it connected two Harvard based, instructional design theories aimed at teaching for understanding and one theoretical view of what it meant to teach for understanding. It extended Piagetian theory to Langer's mindfulness theory.

When the core curriculum is in place, teachers will need a method to teach and a means of understanding their method. The pilot has suggested both a method for practice (writing plans and day to day teaching) and a theory for explaining. That is to say, teachers can teach for understanding with the two Harvard ideas and use Piaget's reflecting abstraction process to think about their levels of thinking. In addition, they can practice the power of mindful learning.

What were the key results? (structure)

At least three results stand out in this pilot:

1. **Children practiced mindful learning in math, literacy, science, and history.**
2. **Children created works ("oeuvres"), including electronic portfolios, to demonstrate understanding and build new understanding.**
3. **Children developed all their multiple intelligences with an emphasis on higher order, logical mathematical and verbal linguistic.**

What surprise surfaced? (model case)

Responding to the Shakespeare for children enrichment reading project that closed out the year, Aliaunda, an average student in terms of final report card grades, created a knowledge as design interview schedule. Then she interviewed four teachers, word processed her findings, mounted them on a science fair presentation board, and delivered a 15 minute talk to the class. She wanted to understand what teachers thought about Shakespeare. She completed an extraordinary project that she planned and executed. In addition to her self selected project, she scored mastery in the science section of the Terra Nova, even though her science grade had been a C on the final report card and her first Terra Nova test had scored moderate mastery for science. She was one of many surprises in a class that fostered deep understanding.

What happens in a class that fosters teaching for understanding? (argument/explanatory)

Exploring the class from the lens of Ellen Langer's mindfulness theory offers novel insights. Langer says mindful learners welcome new information, continuously create categories, and hold more than one perspective. The projects in math, literacy, science or history gave them a lot of chances to welcome ideas about the world and create works not only as final assessments but day to day writing to learn in journal responses, story maps, image maps, KWLS logs etc. The use of knowledge as design in all projects and as a powerful tool of reflection helped them to see multiple perspectives. In short, they became mindful learners. At the same time, use of Howard Gardner's MI approach in each and every multidisciplinary project and content area project (mathematics and literacy) helped children to engage Piaget's reflecting abstraction process.

Not all the children were able to reach the levels beyond empirical abstraction (namely reflecting abstraction, reflected abstraction, and metareflection); but all children had many opportunities to achieve deeper thinking. Thus, both gifted and special needs children stretched.

How might the focus on understanding connect with the core curriculum? (argument/evaluative)

Though the core curriculum will fail to make a focus on teaching for understanding as explicit as the 2001 draft ELA curriculum had done), it will seek to teach for understanding, nonetheless. This will become evident in benchmark tests and Terra Nova assessments designed to document understanding of disciplines.

It seems worth noting that this pilot class at Joseph Pennell Elementary school appears to have earned a much higher percentage of gains than the results for 5th graders across the city.

Eyeballing the data, several children (about 10 of the 29 children scored mastery in at least one of the tested areas: reading, language, mathematics, or science. One child scored mastery in every area tested. Most of the class, about 14, clustered around the national average. A few scored low mastery (about 5). These included two children already receiving resource room help and one special needs child mainstreamed into the class.

The class appeared to have mean gains in each of the tested areas that are equal to or greater than the city gains for 5th grade. Noteworthy is the fact that 5th graders across the district had the largest gains of any other grade. In other words once the facilitator or district calculates class means and percentage of gains in the two administrations of the Terra Nova assessments, it might be clear that the pilot class did well. They may have been among the top classes in the School District of Philadelphia.

At the least, 27 out of 29 student evaluations of the instructional year suggested high satisfaction with the facilitator's approach to thinking, learning, and creating, 2002-2003.

What was missing from the pilot project?

Most remarkably, the facilitator had to construct both the math and literacy programs from scratch. At the beginning of the year, the Houghton Mifflin reading program materials had eroded. The books were old and outdated. The test materials and theme books were missing. As for math, the *Everyday math* materials did not come until the spring of 2003 so the year began with a less than adequate program. There were no unified materials for mathematics or literacy. The facilitator had to create connected materials.

But in the fall of 2003, the job of connecting materials will be easier for all teachers. *Everyday math* will guide the mathematics program and *Trophies* will guide the literacy program. In addition at Joseph Pennell and the other schools selected for the *History Alive* curriculum, a multiple disciplinary project is in place.

A method for mindful learning, the History Alive Project offers six powerful teaching strategies based on three powerful theories: Gardner's MI theory, Cohen's theory of cooperative learning, and Bruner's theory of spiral curriculum.

As of the writing of this report, the facilitator has been participating in the Teaching Curriculum Institute's intensive, one week professional development for History Alive at the new Constitution Center in Philadelphia.

More serious than the lack of unified materials for literacy and math, was the facilitator's omission of specific attention to mindfulness. The facilitator had designed a model of developing mindful learners in 1996—one published internationally in the ERIC data base. That model had guided his design and creation of projects in the past seven years. The model holds mindfulness as a constant and vision-times-framework-times-content as variables that interact to foster mindful learning: M=V (FC).

This pilot class, however, developed only one piece of the model. It did the framework variable in depth—the theory and practice of teaching for understanding. But, such attention cut out explicit descriptions of how mindfulness, vision, framework, and content connected as a whole. The next teacher research report will correct this "graceful error."

What new questions emerge?

For the facilitator's future exploration, at least two new questions emerge from this pilot project.

1. **How might mindfulness become a lens to explore the upcoming core curriculum in the School District of Philadelphia?**
2. **To what degree are teachers mindful about their teaching?**

These questions become new puzzles for a new year.

References

Blythe, T. (1998. *The teaching for understanding guide*. San Francisco. Jossey-Bass.

Fluellen, J. (1996) Developing mindful learners model: A 21st century ecological approach. ED403020

____. (2002). Teaching for understanding: The next 100 years. ED467519

Gardner, H. (1999a). *The Disciplined mind*. New York: Simon and Shuster.

_____. (1999b). *Intelligence reframed: Multiple intelligences for the 21st century*. New York: Basic Books.

_____. (1999c). MI approach. In C. Reigeluth (Ed.) *Instructional-design theories and models: A new paradigm of instructional theory*. Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers.

_____. (1998). Melding traditional and progressive perspectives. In M. S. Wiske (Ed.), Teaching for understanding: Linking research with practice (pp 345-350).

_____. (1983). *Frames of mind: Multiple intelligences theory*. U.S.A.: Basic Books.

Langer, E. (1997). *The power of mindful learning*. Reading, Massachusetts: Addison-Wesley Publishing Company.

Perkins, D. (1986). *Knowledge as design*. Hillsdale, New Jersey: Lawrence Erlbaum Assoiciates.

_____. (1995). *Outsmarting IQ: The emerging science of learnable intelligence*. New York: The Free Press.

Perkins and Blythe, T. (1994). Putting understanding up front. Educational Leadership 51 (5), 4-7.

Perkins, D. and Unger, C. (1999). Teaching and learning for understanding. In C. Reigeluth (Ed.) Instructional-*design theories and models: A new paradigm of instructional theory*. Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers.

Piaget, J. (1977). *Studies in reflecting abstraction*. Philadelphia: Taylor and Francis Group.

School District of Philadelphia. (2003) "Core Curriculum" Workshop at the NW Regional Office, July 24.

Teacher's Curriculum Institute. (2003) History Alive (level one professional development). Palo Alto, California.

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

ERIC Educational Resources Information Center

Reproduction Release

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: Teaching for Understanding: Harvard comes to Pennell Elementary	
Author(s): Jerry E. Flueckiger, Jr.	
Corporate Source: Philadelphia Writing Project	Publication Date: 8-11-03

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, Resources in Education (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options and sign in the indicated space following.

The sample sticker shown below will be affixed to all Level 1 documents	The sample sticker shown below will be affixed to all Level 2A documents	The sample sticker shown below will be affixed to all Level 2B documents
PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY SAMPLE TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)	PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY SAMPLE TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)	PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY SAMPLE TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
Level 1	Level 2A	Level 2B
☑	☐	☐
Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g. electronic) *and* paper copy.	Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only	Check here for Level 2B release, permitting reproductic and dissemination in microfiche only

Documents will be processed as indicated provided reproduction quality permits.
If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.

I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche, or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Signature: Jerry E. Fluellen, Sr.	Printed Name/Position/Title: Jerry E. Fluellen, Jr.	
Organization/Address: 6100 City Ave. #1703 Philadelphia, PA 19131	Telephone: 215 878 5811	Fax: —
	E-mail Address: jerryfluellen@aol.com	Date: 8-12-03

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, or, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant this reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse: